UNITED NATIONS

A

General Assembly

Distr.
GENERAL

A/45/327
13 July 1990

ORIGINAL: ENGLISH

Forty-fifth session
Item 12 of the preliminary list*

# REPORT OF THE ECONOMIC AND SOCIAL COUNCIL

## Achievements of the International Drinking Water Supply and Sanitation Decade 1981-1990

## Report of the Secretary-General

CONTENTS


| | | Paragraphs | Page |
|---|---|---|---|
| I. | INTRODUCTION | 1 - 16 | 2 |
| | A. Scope of the report | 1 - 4 | 2 |
| | B. Historical background | 5 - 9 | 3 |
| | C. The Decade in its economic and social context | 10 - 16 | 4 |
| II. | REVIEW OF ACTIONS AND PROGRESS | 17 - 74 | 5 |
| | A. Experience of the Decade | 17 - 68 | 5 |
| | B. Service coverage | 69 - 74 | 19 |
| III. | PROSPECTS AND STRATEGY FOR THE 1990s | 75 - 102 | 23 |
| | A. Prospects to the end of the century | 75 - 83 | 23 |
| | B. Strategy for the 1990s | 84 - 102 | 25 |


* A/45/50.

90-16698 1593i (E)

/...

best copy available

# I. INTRODUCTION

## A. Scope of the report

1. The General Assembly, in its resolution 40/171 of 17 December 1985, requested the Secretary-General, at the end of the International Drinking Water Supply and Sanitation Decade, in 1990, to prepare a report on the progress achieved by providing a comparative analysis based as much as possible on quantitative data, as well as recommendations for future and follow-up action that might be required.

2. In implementation of the resolution, the present report has been prepared in consultation with the organizations of the United Nations concerned, under the aegis of the Steering Committee for Co-operative Action for the International Drinking Water Supply and Sanitation Decade, and of the Intersecretariat Group for Water Resources of the Administrative Committee for Co-ordination. The report reviews changes in perceptions, attitudes and policy directions which have already had, or are expected to have, a significant impact on the ability of Governments and of the international community to accelerate their efforts towards achieving the goal of providing adequate water supply and sanitation facilities for all. The report also provides a qualitative and quantitative comparative analysis of progress achieved during the Decade in terms of service coverage for drinking water supply and sanitation, and suggests proposals for action in the 1990s.

3. The quantitative comparative analysis of service coverage is based on information provided by Governments to the World Health Organization (WHO) in response to the recommendations of the Mar del Plata Action Plan 1/ to strengthen sector information in order to facilitate the evaluation of the Decade. Additionally, information on sector investments, particularly those of the external support agencies, has been provided through the Country External Support Information (CESI) system developed by WHO with support from Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), the Swiss Development Corporation (SDC) and the United Nations Development Programme (UNDP). Qualitative information has also been provided by Governments and from projects, supplemented by information from the offices of the resident representatives of UNDP and from the donor community.

4. The lack of adequate information on water supply and sanitation at the national level is still a serious constraint to sector planning and management. Nevertheless, the level and quality of national reporting has steadily improved throughout the course of the Decade. Accordingly, the existing data are considered to be reliable and the proportion of the global population represented sufficiently high to enable Decade trends and developments to be identified. However, it may be noted that coverage figures often refer to minimum levels of adequacy in terms of both the quality of the services provided and the density and proximity of services. The definition of what constitutes adequate urban and rural water supply and sanitation services has been left to Governments, since this concept is related to local economic, social and physical conditions. Hence, the application of differing suitability criteria has a strong bearing on levels of coverage reported.

## B. Historical background

5. Recommendation C.12 of the United Nations Conference on Human Settlements held in Vancouver, Canada, in 1976, 2/ called for urgent action to adopt programmes with realistic standards for quality and quantity to provide water for urban and rural areas by 1990 if possible; and to adopt and accelerate programmes for the sanitary disposal of excreta and waste water in urban and rural areas. Subsequently, the United Nations Water Conference, held in Mar del Plata, Argentina, in 1977, recommended that the decade 1981 to 1990 be designated the International Drinking Water Supply and Sanitation Decade.

6. The plan of action on community water supply contained in resolution II 3/ of the Water Conference recognized the serious health consequences of a lack of safe water supply and sanitation, and stressed the need to accord priority to the poor and less privileged and to water scarce areas. It also called upon countries to establish realistic goals for 1990. In order to reach these goals, the Conference recommended that countries should develop national plans and programmes for community water supply and sanitation; initiate immediately engineering and feasibility studies on projects of the highest priority; assess their manpower situation and establish training programmes; promote campaigns to mobilize public opinion and community participation; establish appropriate institutions with specific responsibilities for the planning, implementation and monitoring of programmes; co-ordinate efforts to ensure the provision of technically and socially acceptable sanitary facilities; and develop national revolving funds to encourage the mobilization of resources and equitable participation of beneficiaries, while discouraging wasteful consumption.

7. At the international level, the Plan of Action called upon international and bilateral agencies to increase their financial contributions to strengthen their capabilities to co-operate with Governments, give greater emphasis to social benefits and recognize the need for higher levels of grants and low interest-bearing loans, and shoulder a higher proportion of local costs. The Plan of Action also called for co-operation to be extended, at the request of Governments, to the formulation and implementation of high priority projects and programmes for community water supply and sanitation, for high priority to be given to collaborating with Governments in carrying out human resources surveys and in the establishment of training programmes, for the establishment of an effective clearing-house mechanism for the communication of information on all aspects of community water supply and sanitation, and for the improvement of co-ordination within the United Nations system and with the international scientific community and relevant non-governmental organizations at the country level in order to ensure a multidisciplinary approach to community water supply and sanitation.

8. In its resolution 35/18 of 10 November 1980, the General Assembly proclaimed the period 1981-1990 as the International Drinking Water Supply and Sanitation Decade, called upon Governments to implement the provisions of the Mar del Plata Action Plan, and called upon external support agencies to provide the necessary assistance.

9. A report on progress in the attainment of the goals of the Decade was submitted, through the Economic and Social Council, to the General Assembly at its fortieth session in 1985 (A/40/108-E/1985/49). In its resolution 40/171, the Assembly encouraged Governments to strengthen their efforts to implement the Mar del Plata Action Plan.

## C. The Decade in its economic and social context

10. The situation of the world economy during the course of the Decade was painfully disappointing to many developing countries despite optimistic expectation on its eve. Within just a few years of the Decade's outset, many developing countries encountered such adverse external conditions as a sharp drop in the prices of the non-oil primary commodities on which they relied for much of their export earnings, and a steep rise in real interest rates which resulted in serious debt-servicing problems, particularly in middle-income countries in Latin America. As the Decade advanced, the downturn in growth became more obvious for most developing countries, with the few exceptions of newly industrialized countries and some other countries in East, South-East and South Asia. Low or negative growth was experienced by the least developed countries, particularly in sub-Saharan Africa, where countries were also ravaged by drought, famine, war and other disasters.

11. The slow-down of economic growth led to a significant deterioration of living standards in already low-income countries of Africa, but also in Latin America and Western Asia. The rate of growth in per capita gross domestic product (GDP) in Africa fell from 1.9 per cent a year during the 1971-1980 period to -3.3 per cent a year during the 1981-1988 period, in Latin America from 3.0 per cent to -1.1 per cent, and in Western Asia from 2.8 per cent to -4.3 per cent. 4/ Per capita GDP in constant 1980 United States dollars in sub-Saharan Africa declined from $US 553 in 1980 to $US 427 in 1988. 5/

12. The developing world, which had been historically the net recipient of financial resources, became the net supplier of such resources to the developed world. By 1988 the level of this transfer had reached $US 30 billion. 6/ Rising costs and increasing difficulties in external financing hit most severely those Governments which relied, for the financing of their public investment, on external sources which had been available at relatively low cost in the 1970s. As many of these countries went through wrenching fiscal adjustments during the Decade, such an adverse situation of external financing continued to put pressure on public investment programmes in the area of water supply, sanitation and other urban and rural infrastructures.

13. Population growth, at a time of sluggish economic expansion or stagnation, has been a significant factor contributing to deteriorating living standards and the ever increasing demand for clean water and sanitation in many developing countries. During the first half of the 1980s, the population in developing countries increased at an average rate of 2.1 per cent per annum, as compared to 0.6 per cent per annum in the developed market economies. The rate of population growth in Africa was higher than in any other region, reaching 3 per cent for the period 1980-1985. 7/ The population of developing countries is considered to have increased by 754 million during the 1980s.

READEX FICHE

14. An important aspect of the population growth during the Decade was migration from rural to urban areas in developing countries. As a result, urban population in developing countries of the world grew at 3.6 per cent a year, more than twice as rapidly as rural population, which grew at 1.5 per cent. 8/ Above all, an explosive increase of urban population was registered in mega-cities such as Mexico City, Sao Paulo and Shanghai.

15. The magnitude of the impact of population growth on the provision of water supply and sanitation services to urban areas is evident from the fact that in the case of Africa, for instance, approximately 6.9 million additional people had to be provided with water and 5.4 million with sanitation each year in order to maintain the levels of urban water supply and sanitation coverage existing at the start of the Decade. In Asia and the Pacific, to maintain the status quo, 15.5 million additional urban residents a year had to be provided with water and 13.8 million with access to an appropriate means of excreta disposal. In Latin America and the Caribbean, an additional 7.2 million and 6.9 million people per year would have had to be provided with water supply and sanitation respectively in order to satisfy the same condition. The impact of the rapid rate of population growth on the provision of water supply and sanitation services in mega-cities is examined in studies undertaken with regard to population growth in such cities as Bangkok, Bombay, Dhaka, Delhi, Karachi, Madras and Manila, where a large number of the urban poor lack adequate services. 9/

16. In spite of the many difficulties faced by developing countries, their efforts towards fulfilling their commitments as part of the Decade under the Mar del Plata Action Plan were considerable, even though results often fell short of original expectations.

## II. REVIEW OF ACTIONS AND PROGRESS

### A. Experience of the Decade

17. The recommendations contained in the Mar del Plata Action Plan gradually developed into strategies for action with different emphasis among various Governments, regions and bilateral and multilateral agencies depending on local conditions and sectoral priorities. As the Decade progressed, particular attention was directed to a number of key issues, as outlined below.

#### 1. Institutional setting and sector planning

18. Most of the 50 countries responding to inquiries from UNDP resident representatives in 1989 underscored the utmost importance of having established a national sector plan to the success of their efforts during the Decade. Many were contained within the framework of five-year development plans, sector master plans or action plans set up since the start of the Decade, while others were still in the process of formulation and will be important sector management tools during the 1990s. During the early stages of the Decade several countries already emphasized the need for long-term sector planning rather than restricting themselves to an

arbitrary 10-year period. Others anticipated the need to integrate water supply and sanitation plans into broad plans related to water resources management, pollution control and environmental protection.

19. In the majority of developing countries where Decade plans were established, co-ordinating mechanisms were set up in the form of national action committees, national councils for water resources, decade committees, local action committees and similar groups. However, the fact that these mechanisms were frequently restricted to having an advisory function limited their involvement in the decision-making process, and hence their potential for promotion of water supply and sanitation at the level of national development planning. As a general rule water resources management and administration remain fragmented, and horizontal linkages among ministries and departments dealing with water resources, as well as vertical linkages with those dealing with economic development planning, remain inadequate. This diversity of responsibility and potential overlapping has resulted in many cases in co-ordination difficulties and delays in policy implementation. Integration of water supply and sanitation strategies into environmental planning has proved particularly difficult partly because of the different ministries and agencies involved.

### 2. Community awareness and the promotion of women's participation

20. The role of the community, and particularly that of women in the communities, in the promotion, implementation, maintenance, and management of water supply and sanitation services has undergone a significant change over the course of the Decade. Ten years ago, the community was viewed primarily as a source of unskilled labour, and community participation was generally limited to its mobilization in order to reduce project costs. Most schemes were conceived, directed, and financed by central government agencies or others external to the community concerns.

21. In response to a special emphasis on the role of women called for in the Mar del Plata Action Plan, changes in perception are being reflected at the policy level. In 1980, the World Conference of the United Nations Decade for Women called upon Member States and United Nations agencies to promote the full participation of women in planning, implementation, and application of technology for water supply and sanitation projects. The mid-Decade report of the Secretary-General on Decade progress (A/40/108-E/1985/49) recommended that Member States establish mechanisms for the support of women and community participation in planning, delivery of services, user education and maintenance of facilities. The General Assembly, in its resolution 40/171, encouraged Member States to formulate and implement strategies to enhance the participation of women in the planning, operation and assessment of water and sanitation programmes and projects. More recent regional meetings and donor consultations have focused on specific procedures for increasing women's participation.

22. As the Decade progressed, it became increasingly clear that project success, particularly in rural and peri-urban areas, is highly dependent upon the degree of community participation in projects and their responsibility for continued operation. An important element of these efforts has been the involvement of

communities in health education aspects related to the utilization of facilities. The establishment of a sense of ownership requires that the system users, and women in particular, have some decision-making role in project development, including system planning, financing, operation, maintenance and management. It is now evident that the full participation of the community and enhanced women's involvement, together with the utilization of low-cost appropriate technology, are critical elements in providing safe drinking water supply and sanitation to rural and peri-urban areas on a sustainable basis.

23. In recognition of the important role that women play in water supply and sanitation, a Task Force on Women and the International Drinking Water Supply and Sanitation Decade was established in 1982 by the organizations of the United Nations system through the Steering Committee for Co-operative Action for the International Drinking Water Supply and Sanitation Decade. The work of the Task Force, chaired by UNDP's Programme for the Promotion of the Role of Women in Water and Environmental Sanitation Services (PROWWESS) and supported by the International Research and Training Institute for the Advancement of Women (INSTRAW), resulted in a changed orientation towards women's involvement from a one component approach to an overall approach permeating all project components. This included the development of a planning and evaluation framework (PEGESUS) built on existing evaluation procedures and focusing on increased sustainability and reliability.

24. With regard to efforts for promoting women's involvement at the country level, where approaches can be modified to take into account the different social, cultural, and religious settings, 42 countries are implementing programmes specifically designed to enhance the involvement of women in the development of water supply and sanitation programmes. Of these, 22 are in Africa, 11 in Asia and 9 in the Americas. The experience gained at project level is now beginning to have an effect at the level of national policy.

25. There are some notable successes in the use of community development principles and in promoting the participation of women. In Malawi, the combined use of protected surface catchments and shallow wells was achieved through the mobilization of the community for the construction, operation and maintenance by means of locally organized committees. In Kenya, the Kenya Water for Health Organization works closely with district authorities and the Ministry of Water Development to bring villagers, especially women, into the decision-making process. The experience with the Kwale district handpump project shows that most installed pumps are still functioning and that many committees have raised additional funds which are being used to initiate other activities. In the Philippines, a prerequisite for initiation of rural water supply schemes is the establishment of adequate community-based institutional arrangements and an expressed need by the recipients to have the service and a clear commitment from them to maintain and amortize the costs.

26. In Lesotho, where over a third of all households are headed by women, village water committees have been encouraged to select women for training as "water minders", whose responsibilities include collecting monthly fees. A similar programme to promote women as "pump minders" has also been implemented in

Zimbabwe. In Sri Lankan villages, women have also been active in the business of manufacturing water pumps and have proved to be adept in learning the necessary new skill of metal working, while in Indonesia women's involvement in project development has resulted in increased use of water supply for commercial purposes including vegetable growing, thus benefiting family health while rendering the systems more self-sufficient.

27. Rural sanitation programmes with a strong health education component incorporating specific roles for women have resulted in a significant drop in the incidence of diarrhoea in children under five, a major contributing factor to infant mortality in developing countries. The effectiveness of the combination of information, technical and financial assistance to reduce morbidity in developing countries, and the need to support community participation with technical and logistic back-up is well demonstrated by a community sanitation project in Ecuador, where a national institute supported development through the provision of engineering and technical personnel as well as materials. The successful development of Ventilated Improved Pit (VIP) latrine programmes in the United Republic of Tanzania and Zimbabwe have relied heavily on community participation. The same approach has proven remarkably successful in carrying out low-cost sanitation projects in India and a programme in Lahore, Pakistan, for the installation of household water closets. Further examples of successful community and women's participation include drainage to urban squatter communities in north-east Brazil, and village community-based drainage construction in northern Pakistan.

### 3. Appropriate and affordable technology

28. A large proportion of the unserved population in the rural areas of developing countries could be provided with safe water from ground-water sources by means of handpumps. However, a high proportion of handpumps installed in the past tend to experience operational difficulties and go out of use, resulting in communities reverting to traditional unsafe sources. In fact, prior to the Decade, unreliability of equipment could be cited as the single most important factor hampering the utilization of handpumps. Under these conditions, the need was identified to analyse existing handpump technologies and designs, promote improvements and provide guidance for their selection.

29. The India Mark II pump developed in the 1970s, as well as the development in Kenya of the AFRIDEV pump, have constituted initiatives to respond to the problem in India and Africa, paying particular attention to the needs for village level operation and maintenance. Consequently, the whole question of handpump design and reliability was taken up by Governments as a Decade priority, becoming an example of technical co-operation among developing countries, with Africa and the Indian sub-continent at the forefront. Through intensive development work, the popularity and subsequent expansion in manufacture of the India Mark II pump led to its production by around 50 different firms in India and by several other countries in Africa and Asia. Another example is the spread of manufacture of the Tara pump designed and developed in Bangladesh to Burma, Nepal, Pakistan, Papua New Guinea and Viet Nam.

30. In support of these national initiatives, a major contribution was made through a UNDP programme executed by the World Bank with support from the United Nations Children's Fund (UNICEF) and other organizations, aimed at testing handpumps under laboratory conditions. During the course of the programme, 2,700 handpumps of 70 different types were field-tested, with the participation of the United Nations Volunteer Programme, as components of development work in 17 countries. An important outcome of this effort has been the preparation of guidelines providing Governments and development agencies alike with a practical assessment of pumps tested and reference for equipment selection. These guidelines are contained in the 1987 World Bank publication "Community Water Supply: The Handpump Option".

31. As a natural parallel activity to handpump development and production, considerable attention has been directed to improving technology and reducing the cost of well drilling. In the United Republic of Tanzania and in northern Nigeria, stimulated initially by the needs of small-scale agriculture, low-cost hand-drilling equipment has been introduced on a wide scale, while in Niger improved mechanical equipment for deep drilling has been successfully applied with support from Denmark.

32. Many of the developments in the area of appropriate and affordable technology have resulted from national efforts to solve specific problems. Examples of local technology developments aimed at promoting self-reliant systems are the plastic water-sealed toilet bowls, the water disinfection devices using bamboo cartridges, the coconut husk filters and the pot-type chlorine diffusers introduced at community level in the Philippines. In Indonesia, standard water supply modules for various sizes have been developed for small towns and villages. Bamboo has been used as a substitute for expensive reinforcing steel in walls of household rainwater tanks in Thailand. In several African countries mud and brush or chicken wire walls for latrines have been used instead of concrete blocks, and soil-cement has been used in Brazil for the construction of water tanks. The ferro-concrete water tanks developed in Fiji for household storage and rainwater collection have been adopted by other Pacific Island countries, including Samoa and Vanuatu, and special training courses have been developed to support the transfer of this technology. In Ecuador, the choice of ferro-cement for water reservoir construction is estimated to have saved 60 per cent of previous costs. Also, the use of a locally developed wind-turbine design drawing on the abundant supply of energy at high altitude has significantly reduced energy costs, and this design is under consideration for nationwide application where meteorological conditions are favourable. In Burkina Faso, simple techniques for the protection of water in traditional wells have been tested and introduced while simple water transporting carts have been designed to lessen women's daily drudgery of water-carrying. This innovation has helped to break down prevailing taboos which prevented boys from assisting in the task of water transportation.

33. A wide spectrum of low-cost sanitation options, such as pour-flush latrines, ventilated pit latrines and shallow small bore sewers, have seen extended application in the course of the Decade. An example is the shallow sewer system developed and applied through community participation in high-density low-income urban areas of Brazil, which has also seen application through technology transfer

to Pakistan. Furthermore, efforts have been undertaken to develop and improve purpose-made residue waste removal vehicles for use in association with on-site sanitation systems.

34. The application of appropriate technology has also played an important role in solving the water quality problem of special groups who were often particularly vulnerable. An example of this has been the utilization of slow sand filters combined with multi-tap standposts at refugee camps in southern Somalia. A system was introduced for surveillance of microbiological quality of village supplies in Malawi where technicians from the Department of Water using portable testing equipment and motorcycles can cover large areas by avoiding the need to return samples to a central laboratory.

35. Efforts during the Decade have demonstrated that the application of low-cost appropriate technologies can have a significant impact in lowering both initial investment and operating costs, as well as on improving the reliability of systems. The application of such technologies has been successful in rural areas as a result of concentration of efforts in this sector. As a general rule, however, the expansion of services to urban areas has continued to rely on conventional capital intensive systems. Nevertheless, a significant potential exists for the application of appropriate low-cost technologies for the provision of services to urban areas, in particular to the increasing number of urban poor dwellers.

### 4. Integration of water supply and sanitation into development activities

36. In rural areas of developing countries where water resources exploitation is normally undertaken mainly for irrigation or livestock production, the potential for improving health and well-being through integrating water supply and sanitation components into agricultural development programmes has increasingly been recognized and promoted through the available low-cost appropriate technologies and approaches developed within the framework of the Decade. Conversely, improvements in health and social conditions associated with the provision of safe drinking water supplies have further promoted the development of small-scale crop and vegetable production and poultry rearing.

37. In Pakistan, a project supported by UNDP/UNFDAC and the United Nations Food and Agriculture Organization (FAO) aiming at replacing opium poppy cultivation has incorporated elements specially addressing the questions of health, water supply and sanitation, and has incorporated surface water, tube wells, reticulation and storage systems with standpost outlets for a total of 150,000 inhabitants. In China, a 4,000-hectare irrigation scheme was specifically designed to service the 5,000 rural residents in the development areas through a system comprising standposts served through a treatment, storage and distribution system. Rainwater-harvesting programmes to benefit villages and homesteads including local training have been developed in semi-arid areas of Guatemala. The Government of Botswana has implemented a programme of restoring and improving rainwater catchment tanks for farming families, with associated training of local personnel, while

rehabilitation of community ponds has received attention in Somalia. In Ethiopia, coffee plantation water development has given special attention to the provision of domestic supply to satisfy drinking and sanitation requirements of plantation workers, while in Niger, rural development activities have included the raising of rural living standards through women's integration into water and soil conservation activities in association with a literacy campaign.

38. In North Africa, the reuse of waste water for agriculture offers the potential for allocating other fresh sources for domestic water uses. Consequently, Morocco is developing a national plan for water use which integrates waste water with surface and ground-water resources. Similarly, sewerage for environmental sanitation formed an integral component of an agricultural, social and rural community development programme in Yemen.

### 5. Economic and health impact of increased service coverage

39. One of the most important lessons of the Decade has been the realization that water and sanitation projects, when implemented with real community and women's participation, are effective entry points for development. In addition to achieving their objective of providing water and sanitation services, such projects yield greater economic and social benefits that extend beyond the community itself. This is a result of redirecting efforts and time saved, particularly by women, who often spend as much as five hours daily carrying water, into productive activities, improving the health of the population, and providing water resources for other activities such as growing vegetables. The involvement of the community in the planning, building and operation of water supply and sanitation facilities often yields a strengthening of community organizations and of managerial capabilities that can be transferred to other types of enterprises. It is now understood that the availability of suitable water supply and sanitation facilities provides a stimulus to the development of household commercial activities.

40. The provision of adequate water supply and sanitation facilities is known to be effective in reducing the incidence of infectious diseases. However, national disease reporting systems do not provide sufficiently accurate or comprehensive information to predict in global terms the number of cases of diarrhoeal diseases prevented during the Decade due to the expansion of water supply and sanitation coverage. Nevertheless, as summarized in table 1 below, the results of recent studies carried out in the course of the Decade 10/ indicate that improvements in the provision of water supply and/or sanitation have yielded significant reductions in the incidence of diarrhoeal morbidity.

Table 1. Percentage reduction in diarrhoeal morbidity rates attributed to water supply and excreta improvements (from an analysis of independent studies)

| Type of intervention | Number of studies | Percentage reduction Median | Range |
|---|---|---|---|
| Studies containing references to all interventions | 53 | 22 | 0-100 |
| Studies containing references to improvements in water quality only | 9 | 16 | 9-90 |
| Studies containing references to improvements in water availability only | 17 | 25 | 0-100 |
| Studies containing references to improvements in water quality and availability only | 8 | 37 | 0-82 |
| Studies containing references to improvements in excreta disposal | 10 | 22 | 0-48 |

Source: Esrey, S. A., Feachem, R. G., & Hughes, J. M. (1985). "Interventions for the Control of Diarrhoeal Diseases Among Young Children: Improving Water Supply and Excreta Disposal Facilities", in Bulletin of the World Health Organization, 63(4): 757-772.

41. Significant progress is also taking place with regard to the eradication of dracunculiasis (Guinea worm disease), where simple filtration and source protection methods, even without any disinfection, can break the disease's transmission cycle. Of the 23 countries affected by the disease, of which 20 are in Africa, 10 countries, including Ghana, India, Nigeria and Pakistan, have implemented national plans against dracunculiasis during the Decade. A major achievement has been the drop in cases reported by India from 30,440 in 1985 to a third of this amount in 1990. 11/ Similarly, Burkina Faso has recently reported the eradication of the disease in three highly endemic communities between 1984 and 1986 through filtration of drinking water. 12/ The increased awareness of the seriousness of the disease, as well as of the potential for its eradication, have produced increased emphasis on the need to monitor its incidence, and consequently greater systematization in reporting.

42. With regard to trachoma, the experience of the Decade demonstrates that a 60 to 70 per cent reduction 13/ in cases of trachoma can be achieved if abundant water is available for purposes of personal cleanliness. Similar improvements due to improved accessibility can also be expected in the case of conjunctivitis. The

results of an analysis based on the experience in eight countries in Africa, Latin America and the Caribbean demonstrate the positive effects achieved from improvements in water supply in the reduction of schistosomiasis prevalence and incidence. 14/

43. The economic benefits derived from improved health as a result of having access to safe water supply and sanitation have not been fully evaluated. The available experience, however, indicates that such benefits are considerable. UNICEF, for instance, reports that in a rice-growing area of Nigeria with a population of 1.6 million, an estimated $20 million per year in benefits could be generated from increased rice production and sales if Guinea worm disease, which is endemic to the region, were to be eradicated through the provision of safe water supply. UNICEF further estimates that the generation of this additional income would be sufficient to finance the investments needed for the provision of water to the population through low-cost technology within a period of four years.

### 6. Increased funding and innovative approaches to cost recovery

44. Information available to WHO within its Country External Support Information System (CESI) programme indicates that, allowing for some degree of under-reporting, national water supply and sanitation programmes in developing countries were estimated to be funded in constant United States dollars at approximately $6,000 million per year at the start of the Decade rising to around $8,500 million by the end. Globally, it is estimated that approximately 65 per cent of sector funding during the Decade came from national sources. However, in the case of Africa and the least developed countries, where the major reliance appears to have been on external funding, this proportion was only somewhat over 25 per cent, whereas in western Asia the figure was about 90 per cent.

45. The value of investments in current dollars by external support agencies is reported to have risen steadily from an estimated $2,200 million in 1980 to approximately $4,500 million in 1988. In addition, there has been a sizeable increase in the dollar value of projects under consideration, particularly between 1987 and 1988, when the estimated value of projects under consideration rose from $500 million to $4,000 million. External funds between 1981/82 and 1985/86 in the countries of the Economic Commission for Africa are estimated to have increased in constant United States dollar terms by 77 per cent, while in the countries of the Economic and Social Commission for Asia and the Pacific the increase was 65 per cent. In the countries of the Economic and Social Commission for Western Asia the increase corresponded to 59 per cent, while in the Economic Commission for Latin America and the Caribbean countries the increase was 37 per cent. The growing importance attached to sector financing by Governments and to the role of external support is demonstrated by Morocco, which earmarked 25 per cent of its UNDP indicative planning figure to that sector.

46. A marked change in the pattern of financing provided to the sector has been the increase in the proportion of funds being allocated to institutional development, management improvement, human resources development, community partnership promotion, etc. ("software" programme components). This shift in

emphasis stems from a realization early in the Decade that much of the history of past failures had resulted from investments in the construction of facilities without attending, in parallel, to the development of associated infrastructural requirements. The number of externally funded projects addressing these issues has risen by around 140 per cent, which represents an actual increase in funding to "software" projects or project elements of over 300 per cent. Towards the end of the Decade, allocations for institutional development aspects of water supply and sanitation projects accounted for over 40 per cent of all external funding.

47. Although funding of more affordable appropriate technology projects has increased significantly throughout the Decade, it has retained a comparatively small proportion (4 per cent) of total external sector funding for urban and rural water supply. However, government commitment to such projects has been reflected by an almost sixfold increase in the number being implemented since the start of the Decade.

48. Since financial resources for the sector are extremely limited in most countries, and because radical shifts in sector allocations are unlikely in the foreseeable future, the conclusion is increasingly being reached that project beneficiaries should participate in cost recovery if service coverage in developing countries is to be extended. However, it is becoming apparent that the difficulties in levying charges and collecting payments for water and sanitation systems are frequently related to weak institutional systems and a failure to meet the users' perceived needs.

49. The second half of the Decade has experienced a growing international interest in innovative approaches to cost recovery. Issues of project financing, cost allocation, credit arrangements and user involvement in system development are receiving widespread attention. Specific cost containment and management activities, such as the reduction of unaccounted-for water, the establishment of revolving funds for system financing, the provision of special low interest credits and of local bank guarantees, the setting of water rates acceptable to the users and the consideration of cross-subsidization of user groups and systems as a means of expanding coverage while maintaining affordable water tariffs have been encouraged. Issues related to levels of demand are increasingly being studied in terms of the willingness of users to pay for water and sanitation services. One consequence of greater decision-making on the part of the community is the possibility that the community itself might devise locally acceptable methods of recovering the costs of its water and sanitation system.

50. In Thailand, an innovative approach to cost recovery in rural areas has been the use of revolving funds for the promotion of water supply and sanitation development. These funds are handled at the village level with subsidies and guidance from the Government and a national non-governmental organization (NGO). The approach to cost recovery of the Office national de l'eau et de l'assainissement in Burkina Faso has been related to a programme of extending urban water through standposts and developing the necessary infrastructure for collecting tariffs at the communal outlets. The standpost tariff is fixed at that for a private connection utilizing less than $10m^3$ per month; a reduced tariff also exists for systems utilizing boreholes, pumps and independent reservoirs. It is

often possible to set tariffs for the provision of water to the peri-urban and rural poor at rates that are significantly below to those paid by the population to private vendors.

## 7. Operation and maintenance

51. Inadequate operation and maintenance procedures have traditionally been a major stumbling block in the improvement of water supply and sanitation services.

52. A major difficulty facing many countries in operating and maintaining installed systems has been their lack of financial and institutional capacity. This has too often manifested itself in a lack of fuel to run equipment (generators and vehicles), a lack of materials (chemicals and spare parts) and a lack of trained personnel. As a result of the "tied-aid" nature of support from some donors, inappropriate equipment has often been provided causing operational and maintenance problems with the procurement of spare parts.

53. During the course of the Decade significant efforts have been made to rectify this constraint. In Guatemala, area health personnel of the Ministry of Public Health and Social Assistance continues to give technical support to the communities after systems have been installed and are in operation. In Egypt, the Organization for Reconstruction and Development of Egyptian Villages has had as one of its objectives since 1980 the strengthening of and support to local government at village, district and central level, with a view to improving their capacity for planning, organizing, financing and monitoring systems.

54. The Decade has also witnessed some innovative approaches to promoting community involvement in operation and maintenance. A notable example is the development of the village-level operation and management/maintenance concept for handpumps referred to previously.

## 8. Mobilization of the private sector

55. Traditionally, the private sector has contributed to sector development through the local manufacture of equipment and components and involvement in several aspects related to the provision of services.

56. Examples of private sector initiatives have included leasing arrangements and the franchising of project execution. The involvement of the private sector is a possible vehicle for raising capital for basic services such as water and sanitation. The role of private vendors in the operation of standposts as a replacement for private water vending in urban slum/peri-urban areas is an approach also warranting consideration. Additionally, the private sector has contributed significantly to drilling and water resources surveys through contract-drilling operations. However, experience has proven that when matters of public interest are vested in private hands, regulatory mechanisms are essential. Government interventions are required to ensure that affordable services are extended to the less privileged, and that enterprises do not take advantage of their monopoly position through excessive charges to other economic sectors.

## 9. Human resources development

57. In response to queries through the WHO monitoring programme, 106 of 117 countries reported having assessed their present manpower situation, but only about one third of these have been able to predict future requirements. Although almost half of the developing countries reported having established special training programme budgets, almost all suggested that the funds allocated were inadequate. In global terms, the inadequacy of institutions and the insufficiency of trained professional personnel are still ranked by Governments as two of the most important constraints to programme implementation.

58. Efforts have been directed at the development and application of methodologies for capacity-building corresponding to institutional needs, the review of available training institutes and their curricula in the developing countries, and the review of available training materials. In the Philippines, for instance, the need was identified for improved management capability by the Local Water Utilities Administration. In consequence, a scheme was initiated to develop the capabilities of general managers to perform their tasks more efficiently and to raise morale. An important example of human resources development efforts initiated during the Decade has been the training of qualified personnel in order to increase awareness of the range of appropriate new technologies and approaches for planning and delivering services, through an international network of training centres established with support from the UNDP/World Bank programme. Such centres have been established in India and Indonesia in Asia, and in Burkina Faso, Ghana, Kenya (also serving Uganda and the United Republic of Tanzania) and Zimbabwe in Africa.

## 10. Information exchange

59. Following the recommendations of the Mar del Plata Action Plan in this regard, a number of initiatives have been undertaken, including collaborative efforts by the United Nations system, to build national capacities to absorb and utilize technical information. These efforts were linked with existing networks such as the Pan American networks of information and documentation in sanitary engineering and environmental sciences (REPIDISCA) established at Centro Panamericano de Ingenieriá Sanitaria y Ciencias del Ambiente, Lima, for Latin America; the system operated by Comité interafricain d'études hydrauliques servicing francophone Africa; the Asian Institute for Technology/Environmental Sanitation Information Centre in Asia; and the African Medical & Research Foundation in East Africa. These regional centres, with the support of the International Development Research Centre in Canada and the International Water and Sanitation Centre in The Hague, have assisted in the establishment of information exchange mechanisms at country level in a number of countries. Examples of ongoing information exchange systems are found in the Reseaux sahelien d'information et de documentation scientifiques et techniques (RESADOC) in Mali, and the Water and Sanitation Network (WASIN) in Indonesia. Support for the implementation of similar ventures has also been provided to Thailand and the United Republic of Tanzania. In addition, WHO's Country External Support System contains data on sector and project activities of external support agencies in developing countries.

60. Inter-country co-operation in the area of information exchange has also expanded, as illustrated by the annual meetings co-ordinated by the African Medical and Research Foundation, instituted in 1987, for representatives of government departments and training institutes from Kenya, Uganda and the United Republic of Tanzania to discuss their information needs. This effort has led to a better flow of information including the dissemination of essential books to the participating institutions and their project offices, based on a detailed assessment of needs.

61. International and national NGOs involved in the promotion of appropriate technology, primary health care and rural development have published manuals and communication materials in support of community-based sustainable development. An example is the information exchange network operated by the Asian Alliance of Appropriate Technology Practitioners linking up NGOs in six Asian countries in an effort to collect and disseminate the experiences of grass-root organizations. A bibliography on books produced at country level and a roster of local experts have been one of the results of this networking. Systems such as the Water Supply and Documentation Network (WASSDOC) in Sri Lanka prove that liaison and exchange of information is possible not only between government departments and projects but also with the local NGO community.

## 11. International co-ordination and co-operation

62. In response to calls formulated in the Mar del Plata Action Plan for increased collaboration and improved co-ordination within the United Nations system and with Governments and the external support community, an early initiative was taken through the establishment of a United Nations Inter-agency Steering Committee for Co-operative Action for the International Drinking Water Supply and Sanitation Decade.

63. One of the early Steering Committee initiatives was the identification of key issues and the establishment of interagency task forces to address them and develop common approaches designed to promote co-ordination and co-operation. In addition to a task force on women, task forces were established on human resources development, information exchange, and public information. As a result of these task forces, several films and important Decade support and promotion outputs were produced, including a handbook on human resources development. 15/

64. Assistance to Governments in the co-ordination of activities at the country level has been enhanced by strengthening the capabilities of UNDP resident representatives to act as co-ordinators of United Nations system support to national Decade programmes, and for the promotion of co-operation with other external support agencies at country level. As one of their co-ordinating functions, resident representatives are called upon to bring together the available expertise of the United Nations agencies and other organizations in support of national action committees. Progress in external support co-ordination within the context of national sector planning has been reported from a number of countries including Benin, Chad, Comoros and the Congo in Africa; Bangladesh, China, Nepal, Sri Lanka and Viet Nam in Asia; and Bolivia, Colombia and Panama in the Americas.

65. There has been a significant increase in the support provided to national authorities by external support agencies in the preparation of project proposals, the promotion of specific Decade approaches such as improved pump maintenance, and the promotion of water supply and sanitation at health centres as an element of primary health care. In Africa, external support agencies including the organizations of the United Nations system have participated in the evolution of rural water supply projects, and support has been provided to national authorities in improving project proposals to increase the possibilities of funding. The promotion of Decade programmes by the external community was also carried out through the convening of national and sub-regional Decade Consultative Meetings in Bolivia, Indonesia, Lesotho, Nepal, Niger, Peru, the Philippines, Thailand and Zambia; the Portuguese-speaking countries of Africa; the countries of southern and eastern Africa; Central America and the Caribbean; the South Pacific; and the anglophone countries of the Caribbean. In addition, a regional meeting for the Americas was convened by the Inter-American Development Bank, and co-sponsored by WHO, the Pan American Health Organization (PAHO) and GTZ. These meetings were intended to improve co-operation and co-ordination among external support agencies and national sector agencies, and to initiate intersectoral co-operation. They also aimed at identifying constraints to sector development and courses of action to alleviate them and to facilitate the mobilization of resources. Such meetings brought together national sector agencies and the external support agencies with sector interests to review programmes with the aim of identifying areas of common interest and thus stimulating sector initiatives and co-ordination. The Decade consultative meetings and country sector reviews have been instrumental in identifying areas of programme weaknesses, particularly in peri-urban sanitation and rural water supply and sanitation.

66. Consultations with multilateral and bilateral external support agencies were conducted with a view to strengthening co-ordination of approaches and co-operation in the implementation of programmes. A meeting convened jointly by WHO and the Federal Republic of Germany in Königswinter in 1984 provided an opportunity for information exchange and dialogue on external support experience and measures to be taken in order to improve the efficacy of development assistance. Subsequently, a meeting convened by the Development Assistance Committee of the Organisation for Economic Co-operation and Development (OECD) in Paris in 1985 produced a convergence of views among participants as to the principal constraints to progress in the sector, and on ways of addressing them. A third meeting in 1987 at Interlaken, Switzerland, convened jointly by the Swiss Government and WHO, produced a proposal for a framework for global co-operation beyond the Decade, which was adopted at a fourth consultation convened by the Government of the Netherlands in The Hague in November 1988. As part of this framework, a 1990 Committee was established to define strategies for the next decade. A first meeting of the Committee took place in Paris in December of 1988, and a second meeting was hosted by WHO in Geneva in June of 1989. A meeting of the Collaborative Council was hosted by the French Government in Sophia Antipolis in November of 1989, and focused its attention on issues related to the provision of sustainable water supply and sanitation services to poor urban and rural population, water resources management and environmental issues, and the generation of financial resources.

67. A number of important regional meetings took place during the second half of the Decade. The meetings produced important policy documents concerning the provision of services to low-income groups, and recognizing the health and economic benefits as well as the need to expand programmes for the decade of the 1990s. These policy statements have been accepted as bases for action by the participants representing national water and sanitation sectors and external support agencies, and constituted inputs to global consultative meetings.

68. Finally, a Global Consultation on Safe Water and Sanitation for the 1990s is to be convened in New Delhi from 10 to 14 September 1990, sponsored by UNDP and hosted by the Government of India, with the co-sponsorship of the Steering Committee for the International Drinking Water Supply and Sanitation Decade and of the Collaborative Framework. The objective of the meeting is to promote awareness of the main issues to be faced in the 1990s, and to reach a consensus on strategic actions needed to accelerating progress.

## B. Service coverage

69. About 1,348 million more people were provided with safe drinking water supply in developing countries during the 1980s, 368 million in urban areas and 980 million in rural areas. Similarly, 748 million more people, 314 million urban dwellers, and 434 million people in rural areas were provided with suitable sanitation services. Overall, the number of people without safe water decreased from 1,825 million to 1,232 million, while the number of people without suitable sanitation remained virtually the same. Table 2 below summarizes changes in service coverage achieved during the Decade in each of the regional commission regions. 16/

70. As expected, there are significant variations in increases in service coverage achieved in the various regions. A factor common to all has been the impact of high population growth resulting in an increasing number of people requiring services during the Decade, particularly in urban areas. The number of cities in the world with a population size of 5 million or more has increased from 24 in 1980 to 35 in 1990. Of these, 15 in 1980 and 24 in 1990 are in developing countries, particularly in Asia and Latin America. The population in mega-cities of developing countries grew sharply from 130 million in 1980 to an estimated 228 million in 1990. The population of 23 cities in Africa south of the Sahara grew from 21 million in 1980 to 36 million in 1990. In the region north of the Sahara, eight cities, which accounted for 17 million people in 1980, grew to 25 million by the end of the decade. 17/

Table 2. Water supply and sanitation coverage by region, 1980-1990, and coverage for 2000 at current rates of progress

(Population in millions)

| Region/sector | 1980 Population | 1980 % coverage | 1980 No. served | 1980 No. unserved | 1990 Population | 1990 % coverage | 1990 No. served | 1990 No. unserved | 2000 Population | 2000 % coverage | 2000 No. served | 2000 No. unserved |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Africa | | | | | | | | | | | | |
| Urban water | 119.77 | 83 | 99.41 | 20.36 | 202.54 | 87 | 176.21 | 26.33 | 332.49 | 76 | 253.01 | 79.48 |
| Rural water | 332.83 | 33 | 109.83 | 223.00 | 409.64 | 42 | 172.05 | 237.59 | 496.59 | 47 | 234.27 | 262.32 |
| Urban sanitation | 119.77 | 65 | 77.85 | 41.92 | 202.54 | 79 | 160.01 | 42.53 | 332.49 | 73 | 242.17 | 90.32 |
| Rural sanitation | 332.83 | 18 | 59.91 | 272.92 | 409.64 | 26 | 106.51 | 303.13 | 496.59 | 31 | 153.11 | 343.48 |
| Latin America and the Caribbean | | | | | | | | | | | | |
| Urban water | 236.72 | 82 | 194.11 | 42.61 | 324.08 | 87 | 281.95 | 42.13 | 416.79 | 89 | 369.79 | 47.00 |
| Rural water | 124.91 | 47 | 58.71 | 66.20 | 123.87 | 62 | 76.80 | 47.07 | 122.84 | 77 | 94.89 | 27.95 |
| Urban sanitation | 236.72 | 78 | 184.64 | 52.08 | 324.08 | 79 | 256.02 | 68.06 | 416.79 | 79 | 327.40 | 89.39 |
| Rural sanitation | 124.91 | 22 | 27.48 | 97.43 | 123.87 | 37 | 45.83 | 78.04 | 122.84 | 52 | 64.18 | 58.66 |
| Asia and the Pacific | | | | | | | | | | | | |
| Urban water | 549.44 | 73 | 401.09 | 148.35 | 761.18 | 77 | 586.11 | 175.07 | 1 085.56 | 71 | 771.71 | 314.43 |
| Rural water | 1 823.30 | 28 | 510.52 | 1 312.78 | 2 099.40 | 67 | 1 406.60 | 692.80 | 2 320.79 | 99 | 2 302.68 | 10.11 |
| Urban sanitation | 549.44 | 65 | 357.14 | 192.30 | 761.18 | 65 | 494.77 | 266.41 | 1 085.56 | 58 | 632.40 | 453.16 |
| Rural sanitation | 1 823.30 | 42 | 765.79 | 1 057.51 | 2 099.40 | 54 | 1 133.68 | 965.72 | 2 320.79 | 65 | 1 501.57 | 819.22 |
| Western Asia | | | | | | | | | | | | |
| Urban water | 27.54 | 95 | 26.16 | 1.38 | 44.42 | 100 | 44.25 | 0.17 | 67.26 | 100 | 67.26 | 0.00 |
| Rural water | 21.95 | 51 | 11.19 | 10.76 | 25.60 | 56 | 14.34 | 11.26 | 30.66 | 57 | 17.48 | 13.18 |
| Urban sanitation | 27.54 | 79 | 21.76 | 5.78 | 44.42 | 100 | 44.42 | 0.00 | 67.26 | 100 | 67.26 | 0.00 |
| Rural sanitation | 21.95 | 34 | 7.46 | 14.49 | 25.60 | 34 | 8.70 | 16.90 | 30.66 | 32 | 9.94 | 20.72 |
| Global totals | | | | | | | | | | | | |
| Urban water | 933.47 | 77 | 720.77 | 212.70 | 1 332.22 | 82 | 1 088.52 | 243.70 | 1 902.10 | 77 | 1 456.27 | 445.83 |
| Rural water | 2 302.99 | 30 | 690.25 | 1 612.74 | 2 658.51 | 63 | 1 669.79 | 988.72 | 2 970.88 | 89 | 2 649.33 | 321.55 |
| Urban sanitation | 933.47 | 69 | 641.39 | 292.08 | 1 332.22 | 72 | 955.22 | 377.00 | 1 902.10 | 67 | 1 269.05 | 633.05 |
| Rural sanitation | 2 302.99 | 37 | 860.64 | 1 442.35 | 2 658.51 | 49 | 1 294.72 | 1 363.79 | 2 970.88 | 58 | 1 728.80 | 1 242.88 |

/...

71. The percentage of people with safe water supply and adequate sanitation in the urban areas has either increased or at worse remained static. However, as shown in table 3, with the exception of Western Asia, where full or nearly full coverage has been reached, the achievements of the Decade in terms of reducing the total number of residents without safe water supply and adequate sanitation have more often than not amounted to standing still, or even falling behind. Nowhere is this more evident than in the case of Africa south of the Sahara, where, in spite of a doubling in the number of people provided with services, the number of urban dwellers without safe water supply increased by 29 per cent. Similarly, the number of urban residents without adequate sanitation increased by 31 per cent, even though the number of dwellers availed of services increased by 119 per cent. Globally, the number of urban residents without safe water supply increased by 31 million, while those without sanitation increased by 85 million.

72. The situation in rural areas is more encouraging. Globally, the number of people without safe water supply decreased by 624 million, and those without adequate sanitation by 79 million. Such progress, however, was the result of achievements in Asia and the Pacific and in Latin America and the Caribbean. The results achieved in Asia and the Pacific with regard to rural water supply, which to a great extent are due to very significant increases in coverage reported for the People's Republic of China, are particularly noteworthy.

73. An assessment of progress made towards the attainment of national targets established by Governments as called for in the Mar del Plata Action Plan, indicates that, on the average, the countries of Africa virtually achieved their Decade targets for urban water supply and sanitation. However, they fell short of their targets for rural water supply and sanitation by 15 and 27 percentage points respectively. In Latin America and the Caribbean, the region fell somewhat short of achieving its targets, although it attained its target for urban sanitation. The rural water supply target was surpassed. However, in the case of rural sanitation with only 37 per cent of the population served, countries fell far short of their original objectives by 6 percentage points. In Asia and the Pacific, progress towards Decade goals in the urban areas was disappointing, while the targets for rural areas were surpassed. In Western Asia, the relatively slow progress reported in rural areas resulted in water supply coverage falling 17 percentage points short of its targets of 73 per cent, and in the level of sanitation services remaining static.

74. In the Economic Commission for Europe region (including Canada and the United States) comprising countries which, for the most part, already had high levels of water supply and sanitation services, the Decade stimulated interest in the sector. The ECE countries specifically focused attention on raising the levels of rural water supply and sanitation coverage, where at the start of the Decade, 15 per cent of the population lacked satisfactory water services and 30 per cent were without appropriate sanitation, mostly in remote and topographically difficult areas. The Decade also coincided with an increased awareness that many of the old sewer systems were suffering from the ravages of time and major rehabilitation work was required. In the case of drinking water supply, special attention was directed towards the threat to water resources used for domestic supply purposes posed by intensive agriculture, in the form of nitrates, phosphates and pesticides, and from the disposal of industrial wastes, and towards the health problems associated with old water distribution systems.

Table 3. Percentage increase in the number of people provided with services and in the number of unserved, 1980-1990

| Region/sector | Increases in coverage (per cent) | Increases in number unserved (per cent) |
|---|---|---|
| Africa | | |
| Urban water | 77 | 29 |
| Rural water | 57 | 7 |
| Urban sanitation | 106 | 2 |
| Rural sanitation | 78 | 11 |
| Latin America and the Caribbean | | |
| Urban water | 45 | -1 |
| Rural water | 31 | -29 |
| Urban sanitation | 39 | 31 |
| Rural sanitation | 67 | -20 |
| Asia and the Pacific | | |
| Urban water | 46 | 18 |
| Rural water | 175 | -47 |
| Urban sanitation | 39 | 39 |
| Rural sanitation | 48 | -9 |
| Western Asia | | |
| Urban water | 69 | -88 |
| Rural water | 28 | 5 |
| Urban sanitation | 104 | -100 |
| Rural sanitation | 17 | 17 |
| Global totals | | |
| Urban water | 51 | 15 |
| Rural water | 142 | -39 |
| Urban sanitation | 49 | 29 |
| Rural sanitation | 51 | -6 |

## III. PROSPECTS AND STRATEGY FOR THE 1990s

### A. Prospects to the end of the century

75. As shown in table 2 above, the rate of progress achieved during the Decade would be insufficient to reach the ultimate objective of services for all by the end of the century. If programme implementation were to continue at the current rate, the number of those unserved with safe water by the year 2000 would decrease to around 767 million due to significant increases in coverage in rural areas, which would constitute a decrease from 31 per cent of the total population in 1990 to 16 per cent by 2000. Those unserved with sanitation would rise to around 1,880 million, although the percentage of the population without services would decrease from 43 to 38 per cent due to a small decrease in the number of people in rural areas without coverage. The health and environmental consequences associated with these numbers of people without services would preclude the achievement of living conditions compatible with sustainable development.

76. The situation in urban areas, particularly in large cities, could become alarming. The number of urban dwellers of developing countries in cities of five million people or more is expected to increase from an estimated 228 million in 1990 to an estimated 351 million by the year 2000. 18/ The number of people in 31 cities in Africa is expected to increase by nearly 22.5 million within the next decade. Globally, the number of people in urban areas without adequate water supply facilities would increase by 83 per cent, and the number of dwellers without adequate sanitation services would increase by 68 per cent. In relative terms, both Africa and Asia and the Pacific would be worse off by the end of the century than they were at the start of the 1980s.

77. With the expected high rate of population growth of cities in developing countries, the rapid growth in demand for water for domestic, municipal and commercial uses will often strain existing capabilities to provide the needed water supplies. The provision of additional amounts of water will often require the development of more distant and costlier sources, both in terms of development and conveyance. This situation would inevitably increase unit costs unless steps are taken to offset them through the use of appropriate low-cost technologies. A change away from the more traditional capital intensive approaches to urban water supply and sanitation will often be needed in order to overcome the high levels of investments that would otherwise be required.

78. The 67 per cent drop in the number of people in rural areas without adequate water supply services would be the result of continued significant progress in Asia and the Pacific, and to a lesser extent in Latin America and the Caribbean. The modest increases in service coverage that would take place in Africa would be insufficient to prevent a rise of 10 per cent in the number of people without safe water supply. Globally, the 8 per cent decrease in the number of rural inhabitants without adequate sanitation would also be attributable to decreases in Asia and the Pacific and Latin America and the Caribbean.

79. Recent estimates carried out by UNICEF, in consultation with the World Bank and UNDP, lead to the conclusion that, if water and sanitation service coverage

were to be provided to 90 per cent of the urban and rural population by the end of the century, the average annual level of investment required for new services would amount to approximately $28,200 million, almost three times the average achieved during the 1980s. An estimated increase in overall investments for new services by a factor of 1.4 times would be required during the forthcoming decade to maintain the number of people without services constant by the year 2000. These estimates do not take into account operation and maintenance costs, or investment requirements for the rehabilitation of existing facilities. The achievement of the coverage objectives assumes a major shift towards the utilization of intermediate and low-cost technologies, particularly in urban and peri-urban areas. Rural services would be provided entirely through the utilizations of low-cost technology, while in the case of urban services 50 per cent of services would be provided through high-cost technology. The remaining 50 per cent would be supplied through intermediate and low-cost technologies.

80. Clearly, these higher levels of investments would require sizeable increases in the share of investments for the sector relative to total national investments even under optimistic economic growth scenarios for developing countries. In addition, significant improvements in national absorptive capacities, through improved institutional and human resources, would be necessary. The generation of the necessary financial resources will remain a severe constraint, as evidenced by the fact that all regions have cited insufficiency of financial resources and the inadequacy of cost recovery procedures as two of the most severe constraints still impeding a faster rate of progress. Consequently, means of additional national funding will have to be sought. Efforts will need to be made to attract private funding by such means as national capital markets, the creation of revolving funds and credit guarantee schemes, while selected parts of the sector could be studied in terms of gaining effective access to private sector funding.

81. In spite of the progress achieved during the Decade with regard to operation and maintenance, further improvements will have to be brought about. The lessons learned during the Decade concerning improvements in rural areas will have to be applied as widely as possible. In addition, a large number of urban systems in developing countries are plagued by very high storage and transmission losses, constituting a serious burden to municipalities in terms of operating costs and water supply availability.

82. Increases in the demand for water in urban and rural areas, together with increases in demand for industrial and agricultural purposes, are taking place at a time when a greater number of countries are facing severe limitations in terms of the sustainable carrying capacity of land and water resources. 19/ The allocation of increasingly scarce water resources to competing potential uses, as well as the need to protect the environment from rising levels of pollution from urban, industrial and agricultural wastes, will require, more than ever, the development of balanced approaches to the overall management of water resources, and the establishment of effective linkages between various ministries and governmental organizations dealing with water resources, as well as linkages between them and those governmental organizations dealing with overall economic planning and development. Greater attention will need to be given to increasing efficiency in the use of water in all sectors, including the safe reuse of waste waters.

83. The lack of trained personnel at all levels and the inadequacy of human resources development programmes continue to be among the most severe constraints faced by all countries, together with funding limitations and the inadequacy of operation and maintenance strategies and procedures. As for community participation, and in particular the participation of women in the planning and management process, the results achieved so far have been sufficient to demonstrate the importance of policies designed to foster these approaches. However, the post-Decade period will require an acceleration of such programmes aimed at achieving the widest replications of successful approaches.

## B. Strategy for the 1990s

84. The 1990s will require an intensification of efforts to provide the unserved with water and sanitation services by the end of the century. The recommendations contained in the Mar del Plata Action Plan, continue to be valid, as do those contained in subsequent deliberations of the General Assembly and other international forums, and their implementation has acquired a greater sense of urgency, particularly with regard to the provision of services to rapidly growing urban populations. Within this framework, any strategy for the accelerated expansion of services in the 1990s must be based on the establishment of realistic targets by Governments in terms of the level of service coverage to be achieved, and on the formulation of sustainable social and economic plans.

85. The expected high rates of population growth will continue to put severe pressure on the ability of developing countries to provide water supply and sanitation services to the unserved. In the long run it is to be hoped that policies in support of population and family planning will tend to alleviate such pressures.

86. The Mar del Plata Action Plan states that institutional arrangements adopted by each country should ensure that the development and management of water resources take place in the context of national planning, and that there is real co-ordination among all bodies responsible for the investigation, development and management of water resources. The problem of creating an adequate institutional infrastructure should be kept constantly under review and consideration should be given to the establishment of efficient water authorities to provide for proper co-ordination. Programmes aimed at service expansion must be implemented within the framework of integrated water resources and environmental planning and management, particularly in water-scarce and drought-prone countries, taking into account the need to increase knowledge about the availability of water, as well as its supply for various uses. Increased attention should be paid to improving efficiency in the distribution and utilization of water, and to promoting policies designed to manage water demand relative to resource availability.

87. Governments that have not done so are urged to assess the current status of institutional structures with a view to strengthening their capacity to plan and manage water development and sanitation programmes. This will require an analysis of institutional structures followed by a rationalization of responsibilities to reduce fragmentation and unclear delineation of management tasks among a variety of

government agencies where it is seen as a constraint to accelerating water resources development. The establishment of appropriate linkages to bodies dealing with the formulation and implementation of economic and social development policies will facilitate the flow of financing for the development of water resources in general, and for water supply and sanitation in particular, and will strengthen the integration of the sector into other programmes such as women's and environmental programmes, as well as rural and agricultural development. The establishment of effective linkages will also enable governments to co-ordinate effectively assistance provided by external support agencies.

88. Since a much higher level of financial resources will be required if the challenge of the 1990s is to be met, governments need to assign greater priority to the allocation of development financing to water supply and sanitation by seeking a better integration of the sector within the overall development planning process. In view of the competing demands from other important socio-economic sectors, however, governmental authorities dealing with water supply and sanitation are urged to formulate and implement policies designed to generate alternative sources of funding, to increase the financial self-sufficiency of systems, and to encourage the participation of the private sector in ways compatible with the needs of the urban and rural poor.

89. The continued improvement of operation and maintenance systems still constitutes a critical aspect of actions to be taken by Governments at all levels, if the sustainability of programmes is to be ensured. This will depend largely on the success of actions taken to increase trained manpower, improve community participation, upgrade institutional capability, and institute suitable cost recovery measures. There is a need for the development of guidelines for the effective application of cost recovery principles. The successful formulation and implementation of cost recovery policies normally will be a long-term objective requiring the active participation of the community in terms of the selection of technologies, as well as type and density of service coverage for which they are able and willing to pay, and for the administration of the policies themselves. Improved procedures for the recovery of operating costs, and to the extent possible of investment costs, are needed for the efficient operation of urban and rural water supply systems. Governments are urged to institute the necessary mechanisms to strengthen their capability to implement cost recovery schemes.

90. Governments need to assign a high priority to increasing the impact of existing financial resources, in order to ensure that sustainable services reach the maximum number of people. A key to achieving this will be the application of low-cost technologies which are acceptable to the community and are appropriate in terms of reliability, initial investment costs, ease of operation and maintenance procedures, and operating costs. During the Decade significant progress in the development of low-cost technologies was achieved, particularly in rural areas. Their application however, needs to be considered for, and new methods applied to, the extension of services to the poor in peri-urban areas.

91. The Mar del Plata Action Plan recommended that countries evolve, within the framework of national science policies, a particular policy for research work in the development, management and conservation of water resources. The need still

remains for countries to analyse research and development requirements, particularly in the areas of applied adaptive research, and to develop programmes to ensure that systems introduced are appropriate both from a technical and operational point of view, as well as from a standpoint of social acceptability. The intensification of information exchange will ensure that the results are widely disseminated so as to maximize benefits and avoid duplication of efforts.

92. The Mar del Plata Action Plan also stated that countries should accord priority to conducting surveys to determine national needs for administrative, scientific and technical manpower in the water resources area. Since the availability of suitably trained personnel at all levels remains a serious constraint, countries are urged to conduct manpower surveys to define and identify such needs, or to update existing surveys so as to ensure their validity in the years to come. Surveys should be carried out in the context of planned expansion of services and, where necessary, curricula may need to be modified or strengthened in the formal education sector. The number of water management specialists and engineers should be increased, and national, regional and international training programmes established or strengthened for technicians and workers, including training of villagers for the management, operation and maintenance of local supply facilities. Employment policies, including motivation through improved working conditions, status, and career possibilities, need to be formulated which will encourage the retention of trained personnel. A special target group for training should be women, who are generally under-represented at the professional and technical levels in the sector. Emphasis needs to be given to training in the operation and maintenance of systems at the community level as a key to sustainability of rural systems.

93. Partnerships between developing country and industrialized country sector institutions or professional associations provide a means of overcoming staff shortages at a reasonable cost and contributes to a two-way information exchange benefiting both parties, i.e. the developing countries would benefit from the experience of the industrialized, while the awareness of the needs of the developing countries would be increased in the industrialized countries, hence enhancing their capacity to provide support.

94. The experience acquired during the Decade amply demonstrates the need for the development of government programmes to promote community involvement on a large scale and the continued expansion of women's involvement at the technical and decision-making level. An integrated approach involving the community, enhanced women's involvement and appropriate technology will have an important role to play in rural and peri-urban areas where sustainability will, to a large extent, depend on community participation. Governments should consider the need to develop the necessary technical and financial support programmes, such as extension services and special credit and marketing arrangements in order to ensure the viability of community ventures and the involvement of women.

95. Greater efforts will be needed to monitor service coverage for both water supply and sanitation. Reliable data concerning water supply and sanitation coverage of urban and rural populations are an indispensable tool for formulating effective policies and allocating resources to maximize the economic and social

benefits of expanded services. While improvements in monitoring took place during the Decade, developing countries, as a rule, still lack sufficiently reliable information. In addition, national standards for water quality, accessibility and density of water supply and sanitation services are generally poorly defined and monitored. Countries are urged to review such standards with a view to upgrading minimum services in the 1990s, to establish the necessary procedures in order to have a suitable baseline for service coverage, and to monitor progress in the extension of services.

96. In support of national programmes to attain these objectives, the activities of the external support community, including non-governmental organizations, will need to be strengthened and co-operative programmes made more effective.

97. The United Nations system must continue to act as a catalyst for accelerating water and sanitation programmes at the country level, and as a focal point for promoting global initiatives on public awareness and co-ordinated strategies for water supply and sanitation development. Co-ordination and co-operation among the organizations of the United Nations system will be strengthened by bringing about closer linkages between drinking water supply and sanitation and water resources development as a whole, and in particular, planning and management issues.

98. Co-ordination of the United Nations system with other external support agencies at the global level, in terms of developing common approaches and policies, has been strengthened through the establishment of a Framework for Global Co-operation 20/ aiming at maintaining the Decade momentum into the 1990s, and accelerating the provision of water supply and sanitation services to all, with special emphasis on the provision of such services to the rural and peri-urban poor.

99. Support to the co-ordination of efforts at the country level will continue to be given through the offices of the resident representatives of the UNDP. In this regard, particular attention needs to be given to the assisting governments, at their request, in strengthening their capability to formulate programmes and projects requiring support from multilateral and bilateral organizations.

100. In parallel with improved external support co-ordination and collaboration at country level, and complementary to increased national priority and funding to the sector, external support agencies need to continue to seek ways and means of expanding their financial and technical support to developing countries. International and bilateral financing agencies should explore the possibility of increasing grants and low interest bearing loans, and accepting higher proportions of local costs, particularly for schemes directed at the provision of service to the urban and rural poor.

101. As the availability of trained personnel at all levels and the inadequacy of institutions still constitute two of the most critical constraints, external support agencies may consider the case for developing a major co-ordinated programme aimed at assisting developing countries in the assessment of human resources needs, and in the formulation and implementation of human resources development programmes. Their active involvement is also needed in support of

research activities in developing countries and in the promotion of technical co-operation in the sector.

102. The external support agencies have played an important role in promotion of appropriate low-cost technology, and in the adoption of suitable operation and maintenance procedures. Their continued and expanded involvement in their regard will constitute a pivotal element in the increased momentum for the 1990s.

## Notes

1/ Report of the United Nations Water Conference, Mar del Plata, 14-25 March 1977 (United Nations publication, Sales No. E.77.II.A.12), chap. I.

2/ Report of Habitat: United Nations Conference on Human Settlements (United Nations publication, Sales No. E.76.IV.7), chap. II.

3/ Report of the United Nations Water Conference, Mar del Plata, 14-25 March 1977 (United Nations publication, Sales No. E.77.II A.12), resolution II.

4/ World Economic Survey 1989. Current Trends and Policies in the World Economy, p. 8, (United Nations Publication, Sales No. E.89.II.C.1).

5/ United Nations Department of Economic and Social Affairs.

6/ World Economic Survey 1989, p. 62.

7/ United Nations, Prospects of World Urbanization 1988, p. 7, (United Nations Publication, Sales No. E.89.XIII.8).

8/ Ibid., p. 7.

9/ United Nations, Department of Economic and Social Affairs, Population Growth and Policies in Mega-cities, Population Policy Papers Nos. 5, 6, 7, 8, 10, 12 and 13.

10/ Esrey, S. A., Feachem, R. G., & Hughes, J. M., (1985). "Interventions for the Control of Diarrhoeal Diseases Among Young Children: Improving Water Supply and Excreta Disposal Facilities", in Bulletin of the World Health Organization, 63(4): 757-772.

11/ United States Department of Health & Human Services: Public Health Service, Centre for Disease Control, International Activities - Guinea Worm Wrap-up No. 24, 1989.

12/ United Nations Economic Commission for Africa, "Combatting Guinea-Worm Disease, in Information Bulletin on Water Resources Development in Africa, Maji, Issue No. 1, April 1989.

13/ West, S., et al., "Water Availability and Trachoma", in Bulletin of the World Health Organization, 1989; 67(1): 71-75.

14/ DeWolfe Miller, F., Water Supply Improvements Reduce Schistosomiasis Prevalence and Incidence, proceedings of International Conference of Water 1989, Water Decade and Beyond, Bangkok - World Water Publication.

15/ World Health Organization, Human Resources Development handbook. Guidelines for Ministries and Agencies Responsible for Water Supply and Sanitation. Neil Carefoot and Howard Gibson, eds., Geneva, 1984; WHO document No. WHO/CWS/ETS/84.3.

16/ Population figures are taken from World Population Prospects 1988, United Nations, New York, 1989. (United Nations publication, Sales No. E.88.XIII.7).

17/ United Nations, Prospects of World Urbanization 1988, p. 76.

18/ Ibid.

19/ For a discussion of this question, see: Committee for Development Planning, Water the Fundamental Resource, Occasional paper No. 1, February 1990.

20/ See International Drinking Water Supply and Sanitation Consultation, Interlaken, Switzerland, 13-16 October 1987, Consultation secretariat, CWS/WHO.

---